

## ***Opistognathus albicaudatus*, a new species of jawfish (Teleostei: Opistognathidae) from the Andaman Islands**

WILLIAM F. SMITH-VANIZ

Research Associate, Division of Ichthyology, Florida Museum of Natural History, University of Florida, Gainesville, FL 32611, USA.  
E-mail: smithvaniz@gmail.com

### **Abstract**

A new species of jawfish, *Opistognathus albicaudatus*, is described based on two specimens, 91.4–94.8 mm SL, from the Andaman Islands. The combination of an elongate upper jaw produced as thin flexible lamina, and a unique colour pattern consisting of an abruptly white caudal fin and gill arches with a series of 8–10 small dark spots, each near the base of a gill raker, distinguishes the new species from other congeners. Based on morphological similarity and general color pattern, the new species seems to be most closely related to *Opistognathus variabilis*. These two species appear to have allopatric distributions. A range extension for *O. cyanospilotus* is also reported.

**Key words:** Jawfish, *Opistognathus*, new species, Andaman Islands

### **Introduction**

The jawfish family Opistognathidae, includes about 50 currently recognized Indo-West Pacific species plus many undescribed species. All of them occupy burrows which they construct and maintain using their wide mouths. Their obligatory burrow dwelling behavior makes most jawfishes difficult to observe and capture by standard methods except for the occasional trawl collection. Fortunately, the increasing use of scuba has enabled intrepid ichthyologists to seek out jawfish habitat and with a little experience learn to recognize and locate their burrow openings. Because jawfish rarely leave occupied burrows, they can easily be collected by squirting a mixture of the anesthetic clove oil down their burrows and then capturing the anesthetized fish with a hand-net after they emerge. Gerry Allen, Mark Erdmann and Jack Randall, in particular, have all had the good fortune and opportunity to dive at many locations throughout the Indo-West Pacific, photographing and collecting fishes. Each of them has made a special effort to collect jawfishes and for that reason alone discovery of new species of Indo-Pacific jawfishes continues seemingly unabated. One such recent discovery is the new species described herein. This new *Opistognathus* has the posterior end of its long upper jaw produced as a thin flexible lamina. Had this species been collected earlier it would have been treated by Smith-Vaniz (2009) along with several other jawfishes with similar jaw morphology. The difficult to collect habitat together with a distribution probably limited to the Andaman Islands is the reason this species of *Opistognathus* was not collected until very recently.

### **Material and methods**

Type specimens are deposited in the Western Australian Museum, Perth (WAM). Methods and format of the description follows Smith-Vaniz (2009).

***Opistognathus albicaudatus* new species**

Whitetail jawfish

Figures 1–4

**Holotype.** WAM P.3332-001, male, 94.8 mm SL, Andaman Islands, Fusilier Strait, 11°52.6'N, 93°3.13'E, depth 35 m, clove oil, Mark V. Erdmann, 18 January 2010.

**Paratype.** WAM P.33256-001, male, 91.4 mm SL, same locality as holotype, depth 32–33 m, clove oil, Mark V. Erdmann, 22 March 2010.

**Diagnosis.** A species of *Opistognathus* with an elongate supramaxilla and maxilla whose posterior end is produced as a thin flexible lamina that in adults extends to or beyond rear margin of opercle; inner lining of upper jaw and adjacent membranes with one conspicuous black stripe; in life, caudal fin uniformly white; first gill arch with conspicuous, small dark blotches (8–11), each adjacent to a gill-raker base; dorsal fin XI, 15; body with about 72–75 oblique scale rows.

**Description.** (Counts for paratype given in parentheses if different from those of the holotype; when bilateral counts vary, they are presented as left/right.) Dorsal-fin rays XI, 15. Anal-fin rays III, 15. Pectoral-fin rays 20 (21). Caudal fin: procurrent rays 4+3 (3+3), segmented rays 8+8, middle 12 branched; hypural 5 absent. Vertebrae: 10+19; last rib on vertebra 10; epineurals 10. A single supraneural bone inserted between neural spines 1–2. Gill rakers 11+21 (20).

Scales absent on head and body anterior to vertical from 6th dorsal-fin spine, and from area above and below lateral line, pectoral-fin base and anterior 1/3 of belly. Body with about 74/75 (72/72) oblique scale rows. Lateral-line ends below vertical from 5th or 6th segmented dorsal-fin rays. Lateral-line pores very numerous, arranged in multiple series along embedded lateral-line tubes. Cephalic sensory pores relatively numerous (Fig. 2), completely covering nape; dentary pore positions 1 and 2 with relatively large, single pores, 3rd position with 2/3 (1/1) pores, 4th with 8/7 (4/2) pores, 5th with 16/18 (11/11) pores; all preopercular pore positions with multiple pores.

Anterior nostril slightly closer to posterior nostril than to dorsal margin of upper lip, and consisting of short tube with tiny tentacle on posterior rim that when depressed does not reach posterior nostril; Height of anterior nostril shorter than to about equal maximum diameter of posterior nostril. Dorsal fin moderately low anteriorly, profile relatively uniform with slight change in fin height at junction of spinous and segmented rays. Dorsal-fin spines relatively slender and slightly curved distally with flexible tips; all except 1st segmented dorsal- and anal-fin rays branched distally. Outermost segmented pelvic-fin ray not tightly bound to adjacent ray, interradial membrane incised distally. Posterior margin of preopercle distinct with free margin. No papillae on inner surface of lips. Fifth cranial nerve passes under A1  $\beta$  section of adductor mandibulae.

Upper jaw extends 2.1 to 2.2 eye diameters behind posterior margin of orbit; maxilla somewhat scimitar-shaped, widest before end and with well-developed flexible lamina posteriorly; supramaxilla elongate and subterminally positioned. Premaxilla with an outer row of small conical teeth that become progressively smaller posteriorly; and 1–3 irregular rows of smaller inner teeth anteriorly. Dentary with an outer row of conical teeth, largest mid-laterally; 2 or 3 irregular inner rows of smaller conical teeth anteriorly, those in posterior row largest and slightly canted backwards. Vomerine teeth absent. Infraorbital bones tubular with wide openings for sensory canals, 3rd infraorbital relatively robust with large suborbital shelf.

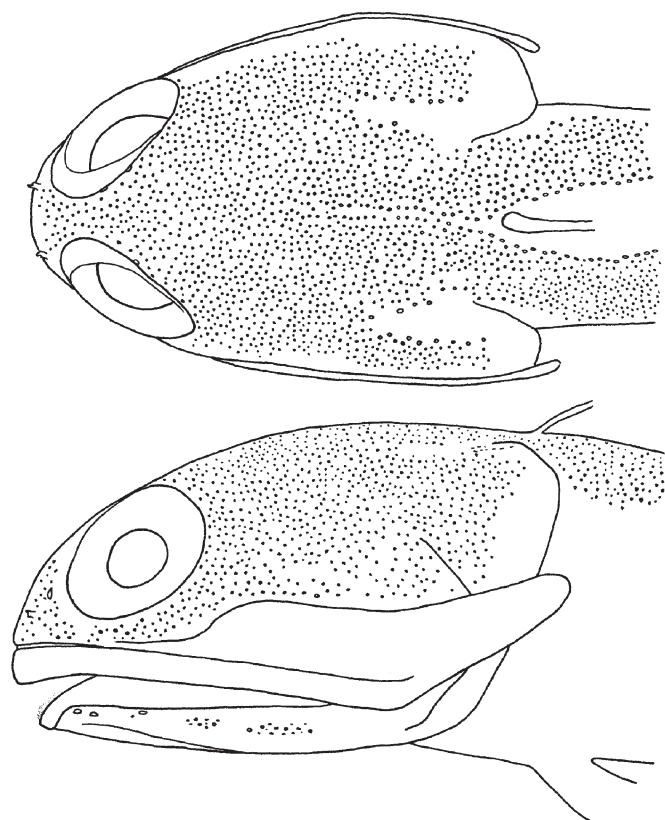
Measurements of the 94.8 mm SL male holotype and 91.4 mm SL male paratype (in parentheses), as percent of SL: predorsal length 28.8 (30.3); preanal length 52.6 (49.0); dorsal-fin base 67.3 (73.7); anal-fin base 39.9 (40.6); pelvic fin length 19.2 (20.7); caudal fin length 17.8 (18.7); depth at anal-fin origin 16.7 (19.3); caudal peduncle depth 9.3 (9.3); head length 30.2 (30.5); postorbital-head length 18.0 (18.3); upper jaw length 29.4 (30.0); postorbital-jaw length 18.6 (18.3); orbit diameter 8.3 (8.7). As percent of head length: postorbital-head length 59.8 (60.0); upper jaw length 97.6 (98.4); postorbital-jaw length 61.5 (60.0); orbit diameter 27.6 (28.6).

Colour pattern in preservation: The most striking feature of the color pattern is the very dark posterior half of the body and adjacent fins followed by an abruptly and uniformly white caudal fin (Fig. 3). Spinous dorsal with narrow brown margin, anal and soft dorsal fins very dark with very narrow white distal margin; dorsal fin also has about eight to ten dark basal blotches, but posterior ones barely discernable on holotype, and row of indistinct small dark spots through the middle of soft dorsal fin centered on each ray. Pectoral and pelvic fins immaculate. Head and body brown, becoming much darker posteriorly; cheek with a few small dark spots and dashes above jaw, and upper and lower lips with a few dark bands. Inner lining of upper jaw and adjacent membranes with single conspic-

uous black stripe, bordered internally by a white stripe. Esophageal opening surrounded by black that extends to base of upper pharyngeal tooth patches. First gill arch with conspicuous, small dark blotches (8–11), each adjacent to a gill-raker base.



**FIGURE 1.** *Opistognathus albicaudatus*, n. sp., live holotype, WAM P.33321-001, male, 94.8 mm SL, Fusilier Strait, Andaman Islands: (above) just emerging from burrow, (below) attempting to swim away. Photographs by G. R. Allen.

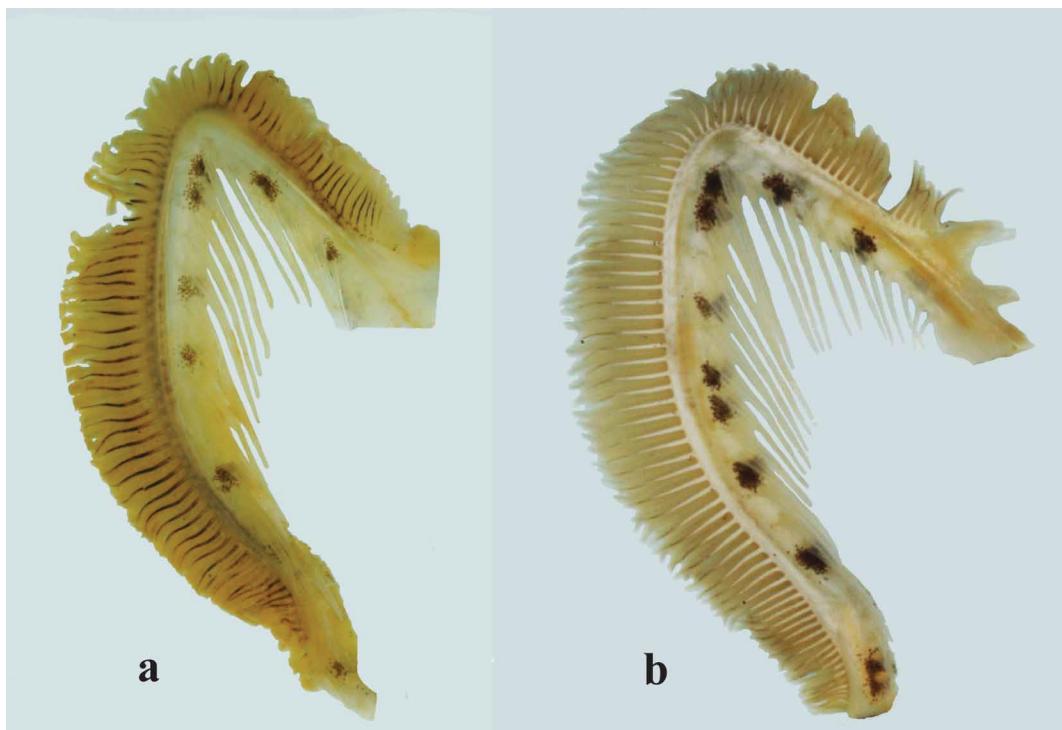


**FIGURE 2.** Cephalic sensory pores of *Opistognathus albicaudatus*, paratype, WAM P.33256-001, male, 91.4 mm SL, Fusilier Strait, Andaman Islands.



**FIGURE 3.** Caudal fin of *Opistognathus albicaudatus*, holotype. Photo by H. L. Jelks.

Colour in life (Fig. 1). Life colours of holotype very similar to that described above. Posterior half of body, adjacent part of dorsal and anal fins dark blue; caudal fin white with the intensity more pronounced near base of fin; dorsal fin pale brown anteriorly with narrow brown distal margin and eight to ten dark brown basal blotches. Body gradually changes from pale brown to blue posteriorly, and brown head changes to pale yellow-green ventrally, except the jaws which have brown bands; belly, pectoral-fin base, gill membranes, branchiostegal rays and throat pearly white. Iris uniformly chestnut except for a narrow yellow ring around the pupil.



**FIGURE 4.** Right gill arches of *Opistognathus albicaudatus*: a, holotype, 94.8 mm; b, paratype, 91.4 mm SL. Photographs by H. L. Jelks.



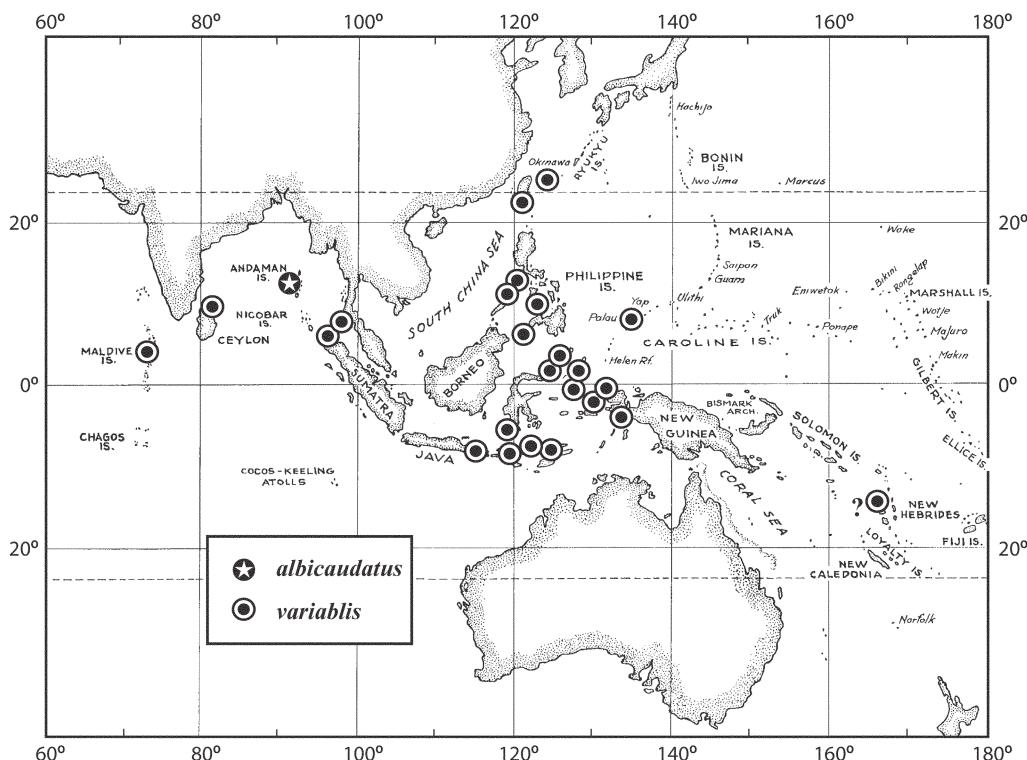
**FIGURE 5.** *Opistognathus cyanospilotus*, WAM P. 33259-004, male, 96 mm SL, N. Cinque Island., Andaman Islands. Photo by G. R. Allen.

**Comparisons.** Five previously described species of jawfishes are known from the eastern Indian Ocean: *Opistognathus nigromarginatus* Rüppell, *O. cyanospilotus* Smith-Vaniz, *O. variabilis* Smith-Vaniz, *O. rosenbergii* (Bleeker) and the closely related *O. annulatus* (Eibl-Eibesfelt), endemic to the Nicobar Islands and originally

described (Eibl-Eibesfelt 1961) as a subspecies of *O. rosenbergii*. The first three species were recently treated by Smith-Vaniz (2009). The other two species plus *O. cyanospilotus*, and two additional new species of *Opistognathus* (known from the Andaman Islands, Indonesia and the Philippines) differ from *O. albicaudatus* by having the end of the upper jaw truncate or bluntly rounded with the maxilla either rigid or with only a slight flexible lamina posteriorly. *Opistognathus albicaudatus* can easily be distinguished from all seven of these species by color pattern, most obviously by its uniformly white caudal fin.

*Opistognathus variabilis* appears to be most closely allied to the new species. Except for differences in colour pattern, *O. albicaudatus* is superficially so similar to some individuals of the long-jaw morph of *O. variabilis* that one might be misled into regarding it as just another local variant of this broadly distributed and geographically variable species. All except Philippine specimens of *O. variabilis* from northern Palawan and Negros have the same number of dorsal- and anal-fin spines and rays and vertebral counts as in *O. albicaudatus* and other meristic values are within the range of overlap; the only exception being the higher number of total procurrent caudal rays: 9–11 (in 49 specimens), versus only 6–7 in *O. albicaudatus*. The two species also differ in one aspect of their pore patterns. Although the dorsum of the head has numerous pores in both species, there is an unpored Y-shaped area in front of the first dorsal-fin spine in *O. variabilis* (see Smith-Vaniz 2009, Fig. 41) while that region of the head is completely covered with pores in *O. albicaudatus*. Adult males of *O. variabilis* always have relatively dark caudal fins (caudal fins paler and finely banded in females) in contrast to the abruptly and uniformly white caudal fins of *O. albicaudatus*. Another difference in color pattern between these species involves the gill arches; in *O. albicaudatus* a series of distinct dark spots is located in a somewhat regular pattern along both arms of the arch (Fig. 4) while in *O. variabilis* the gill arches are uniformly pigmented.

**Remarks.** Habitat consisted of a flat, current-swept sand and rubble plain at approximately 25–30 m depth without coral growth but with an occasional low, stunted gorgonian sea fan present. Because the current was so strong (3+ knots) and with nothing to hold onto or shelter behind, Erdmann (pers. comm.) had to shoot his spear into the sand next to the jawfish burrows to create a holdfast to cling to while applying clove oil into the burrows. Three occupied burrows were discovered, but unfortunately he managed to collect only two specimens of the new jawfish.



**FIGURE 6.** Distributions of *Opistognathus albicaudatus* and *O. variabilis*.

*Opistognathus cyanospilotus* (Fig. 5), previously known from the Andaman Sea and Bali but not from the Andaman Islands, occurs in the same environment as *O. albicaudatus* and was collected from four separate burrows. The following material represents a new locality for the species: WAM P.33259-004 (4, 96.4–106.6 mm SL) Andaman Islands, N. Cinque Island. (11°19.935'N, 92°43.483'E), 25m, clove oil and hand-net, Mark V. Erdmann, 19 January 2010.

**Distribution.** *Opistognathus albicaudatus* is only known from Fusilier Strait in the Andaman Islands (Fig. 6) and appears to have an allopatric distribution with respect to its presumed closest relative *O. variabilis*.

**Etymology.** From the Latin *albus* (white) and *cauda* (tail). The suggested common name is whitetail jawfish.

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